

What is claimed is:

1. A heat exchanger for exchanging heat between first and second coolants, comprising:

5 a first tube formed with a first flow passage through which the first coolant flows;
 a second tube formed with a second flow passage through which the second coolant flows;

 a first inlet-connecting block connected to a first end of the first tube and having a first flow inlet communicating with the first flow passage;

10 a first outlet-connecting block connected to a second end of the first tube and having a first flow outlet communicating with the first flow passage;

 a second inlet-connecting block connected to a first end of the second tube and having a second flow inlet communicating with the second flow passage; and

 a second outlet-connecting block connected to a second end of the second tube and
15 having a second flow outlet communicating with the second flow passage;

 wherein the first and second tubes are disposed such that the first and second flow passages are substantially perpendicular to one another.

20 2. The heat exchanger according to claim 1, wherein the first and second tubes include pluralities of pieces of tubes, respectively.

 3. The heat exchanger according to claim 2, wherein the first tube is sandwiched between the adjacent second tubes.

25 4. The heat exchanger according to claim 3, wherein the first tubes are disposed in

parallel to one another along a longitudinal direction of the heat exchanger, and the second tubes are disposed in parallel to one another along a vertical direction of the heat exchanger.

5 5. The heat exchanger according to claim 4, wherein the second tubes include an inflow tube group and an outflow tube group, and tubes that belong to the inflow tube group have first ends connected to the second inlet-connecting block and second ends connected to a terminal connecting block while tubes that belong to the outflow tube group have first ends connected to the terminal connecting block and second ends
10 connected to the second outlet-connecting block.

6. The heat exchanger according to claim 5, wherein the second tubes are disposed in a zigzag arrangement.

15 7. The heat exchanger according to claim 4, wherein the second flow passage is formed in a substantially U-shaped configuration in the second tube.

8. The heat exchanger according to claim 7, wherein the second tube has a first opening portion communicating with the second flow inlet and a second opening
20 portion communicating with the second flow outlet.

9. The heat exchanger according to claim 8, wherein the first opening portion is formed on the second tube at a first end thereof, and the second opening portion is formed at a position spaced from a second end of the second tube by a given distance.

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10. The heat exchanger according to claim 7, wherein the second tube further includes an air bleed portion formed in the second flow passage and discharging air, accompanied by flow of second coolant, to the outside thereof.

5 11. The heat exchanger according to claim 7, wherein the second tube further includes a flow path partitioning portion to allow the second coolant to flow from the second inlet-connecting block to the second outlet-connecting block smoothly.

10 12. The heat exchanger according to claim 11, wherein second coolant smoothly flows from the second inlet-connecting block to the second outlet-connecting block due to the flow path partitioning portion, even in a case where the first opening portion communicates with the second flow outlet and the second opening portion communicates with the second flow inlet.